Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEPHAN KIRCHMEYER,
HANNS-PETER MÜLLER,
MARTIN ULLRICH,
and
ULRICH LIESENFELDER

Appeal No. 1999-1390
Application No. 08/655,783

ON BRIEF

Before OWENS, DELMENDO, and JEFFREY T. SMITH, Administrative Patent Judges.

DELMENDO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 2, and 4, which are all of the claims pending in the above-identified application.

The subject matter on appeal relates to a process for the production of thermoplastic polyurethane elastomer. Further

details of this appealed subject matter are recited in illustrative claim 1 reproduced below:

> 1. A process for the production of thermoplastic polyurethane elastomer comprising
> (a) introducing and homogeneously mixing (A), (B) and optional (C) in a first static mixer at a shear rate of 500 to 50,000 s^{-1} and at a temperature of 50 to 250°C, to form a substantially unreacted mixture wherein no more than 10 wt.% of said (A) has reacted and
> (b) reacting said substantially unreacted mixture in a second static mixer operating at a shear rate of 1 to 100 s^{-1} and a temperature of 50 to 250°C, to form a thermoplastic polyurethane elastomer, and
> (c) continuously degassing and extruding said thermoplastic polyurethane elastomer,
> wherein (A) denotes one or more isocyanates, and where (B) denotes a mixture of (B1) and (B2) where B1 is 0 to 85 equivalent-% (relative to the isocyanate groups in (A)) of one or more compounds having an average of 1.8 to 3.0 Zerewitinoff active hydrogen atoms and a number average molecular weight of 450 to 10000, and where B2 is 15 to 100 equivalent-% (relative to the isocyanate groups in (A)) of one or more chain extenders having an average of 1.8 to 3.0 Zerewitinoff active hydrogen atoms and a molecular weight of 62 to 400, and where (C) is an amount up to 20% (relative to the weight of said thermoplastic polyurethane elastomer) of auxiliary additives.

The examiner relies on the following prior art reference as evidence of unpatentability:

Endmann et al. (Endmann)(published DE patent application)	2,823,762	Dec. 14, 1978

Claims 1, 2, and 4 on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over Endmann.[1] (Examiner's answer, pages 4-6.)

We reverse the aforementioned rejection. In addition, we remand the application to the examiner for consideration of a possible obviousness-type double patenting rejection of the appealed claims over the claims of commonly assigned U.S. Patent 5,739,252 issued to Kirchmeyer et al. (Kirchmeyer) on April 14, 1998, copy attached.

The examiner's position is stated as follows:

> The reference discloses the production of thermoplastic polyurethanes by serially passing diisocyanates, polyols, and chain extenders through two static mixers, wherein an urethanating reaction occurs within the mixers. See claims and pages 5-11 of the translation of DE 2823762. Though the reference is silent regarding the claimed shear rates, the position is taken that the shear rates are inherent characteristics of the disclosed static mixing process. However, even if the shear rates are not inherent characteristics of the disclosed process, the position is taken that it would have been obvious to one of ordinary skill in the art to optimize the respective shear rates of the static mixers, so as to arrive at a process which causes homogeneous mixing and reaction of the polyurethane and which prevents accumulation of reaction product within the mixers. [Examiner's answer, page 4; underscoring added.]

[1] Like the examiner, we also rely on the English language translation of Endmann as found in the record.

Although Endmann teaches the production of polyurethanes by performing the reaction in two serially arranged static mixers (translation, page 4), we agree with the appellants' analysis and conclusion (appeal brief, pages 3-4; reply brief, page 2) that the examiner has not established a prima facie case of obviousness within the meaning of 35 U.S.C. § 103. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

As admitted by the examiner (answer, page 4), Endmann does not describe any shear rates for the mixers, much less the specific shear rates recited in the appealed claims. While the examiner alleges that the recited shear rates would be inherent in the prior art process, it is well settled that inherency cannot be established by mere possibilities or probabilities.[2] In this regard, the examiner has not established that the residence times, flow velocities, and length to diameter (L/D) ratios described in Endmann for the premixer and the second static mixer (translation, pages 7-10) would necessarily correlate to the shear rates recited in the appealed claims.

[2] See Mehl/Biophile Int:l Corp. v. Milgraum, 192 F.3d 1362, 1365, 52 USPQ2d 1303, 1305 (Fed. Cir. 1999); In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981); Hansgirg v. Kemmer, 102 F.2d 212, 214, 40 USPQ 665, 667 (CCPA 1939).

Moreover, Endmann does not describe the exact nature of the mixing elements, which would normally impact shear rate.

As to the examiner's argument that one of ordinary skill in the art would have optimized the shear rates in the mixers, we point out that there is no evidence to indicate that optimization of shear rates in the mixers for the purposes described in Endmann would necessarily result in the ranges of shear rates recited in the appealed claims.

For these reasons, we reverse the examiner's rejection under 35 U.S.C. § 103 of appealed claims 1, 2, and 4 as unpatentable over Endmann.

On return of this application, the examiner should analyze whether any or all of the appealed claims should be rejected as unpatentable under the judicially created doctrine of obviousness-type double patenting over claims 1 through 4 of U.S. Patent 5,739,252. Patented claim 1 recites:

> 1. A process for the production of thermoplastic polyurethaneurea elastomer comprising
> (a) introducing and homogeneously mixing (A), (B) and optionally (C) in a first static mixer at a shear rate of 500 to 50,000 s^{-1} and at a temperature of 50° to 250°C., to form a substantially unreacted mixture and
> (b) reacting said substantially unreacted mixture in a second static mixer operating as a shear rate of 1 to 100 s^{-1} and a temperature of 50° to 250°C., to form thermoplastic polyurethaneurea elastomer, wherein (A) denotes one or more

> polyisocyanates, and where (B) denotes a mixture of (B1) and (B2) and (B3) where
> (B1) is 40 to 85 equivalent-% (relative to the isocyanate groups in (A)) of one or more compounds having an average of 1.8 to 3.0 Zerewitinoff active hydrogen atoms and a number average molecular weight of 400 to 10000, and where
> (B2) is 10 to 60 equivalent-% (relative to the isocyanate groups in (A)) of water, and where
> (B3) is 0 to 45 equivalent-% (relative to the isocyanate groups in (A)) of one or more chain extenders having an average of 1.8 to 3.0 Zerewitinoff active hydrogen atoms and a molecular weight of 62 to 400, and where
> (C) is 0 to 20% (relative to the weight of said thermoplastic polyurethaneurea elastomer) of conventional auxiliary additives.

Regarding the term "polyurethaneurea," the patentees define this term as a "polyurethane[s] with additional urea groups." (Column 1, lines 31-32.) With respect to the recitation "a substantially unreacted mixture," the patentees enlighten one skilled in the relevant art that this would include "up to 10 wt.%" of reacted isocyanate groups. (Column 6, lines 33-35.)

Thus, it would appear to us that the subject matter of the patented claims would have fairly suggested to one of ordinary skill in the art a process encompassed by the claims on appeal. The examiner should consider whether a new rejection should be entered.

The decision of the examiner is reversed.

This application, by virtue of its "special" status, requires an immediate action. See MPEP ' 708.01(D) (7th ed., Rev. 1, Feb. 2000). It is important that the Board be promptly informed of any action affecting the appeal in this case.

REVERSED AND REMANDED

TERRY J. OWENS	)
Administrative Patent Judge	)
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	) BOARD OF PATENT
ROMULO H. DELMENDO	)
Administrative Patent Judge	) APPEALS AND
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	) INTERFERENCES
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JEFFREY T. SMITH	)
Administrative Patent Judge	)

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